

CLAIMS

[1] A power supply comprising:

a voltage generating section (2, 3, 4) which generates a voltage to be supplied to a load;

5 a drive control section (6) which generates a drive signal when supplied with a drive control voltage necessary for generating said drive signal, supplies said generated drive signal to said voltage generating section (2, 3, 4) to drive and control said voltage generating section (2, 3, 4); and

10 a drive-control voltage supply section (8) which applies said drive control voltage to said drive control section (6) when activated, stops said drive control section (6) when an output current to be supplied to said load becomes less than a preset current value, and operates said drive control section (6) after a predetermined time elapses since stopping of said drive control section.

15 [2] The power supply according to claim 1, wherein said voltage generating section comprises:

a transformer (T) having a primary winding and a secondary winding;

a DC voltage input section (2) which receives an AC voltage and applies a DC voltage that is said input AC voltage rectified and smoothed to said primary winding of said transformer (T);

20 a switching section (Q1) which generates a voltage on said primary winding of said transformer (T) by switching a current flowing in said primary winding of said transformer (T); and

25 a rectifying and smoothing section (4) which rectifies and smoothes a voltage generated on said secondary winding of said transformer (T), and supplies that voltage to said load,

whereby said drive control section (6) supplies a pulse signal for said switching section (Q1) to switch said current to said switching section (Q1) as the drive signal, thereby

driving and controlling said switching section (Q1).

[3] The power supply according to claim 2, wherein said transformer (T) has a third winding (n3), and

said drive-control voltage supply section (8)

5 comprises:

a capacitor (C3) which applies a charged voltage to said drive control section (6) as the drive control voltage;

a charge circuit section (13, 14, R21) which supplies a current to said capacitor (C3) from said DC voltage input section (2) of said voltage generating section (2, 3, 4) to charge
10 said capacitor when said DC voltage input section (2) starts inputting a DC voltage to said primary winding of said transformer (T);

an auxiliary power supply section (7) which rectifies a voltage generated on said third winding (n3) of said transformer (T) and applies that voltage to said capacitor (C3) to charge said capacitor (C3);

15 a charge control section (17) which stops charging of said capacitor (C3) from said charge circuit section (13, 14, R21) when the drive control voltage to be supplied to said drive control section (6) becomes equal to or greater than a preset voltage value;

an operation stop section (15) which detects an output current to be supplied to said load, compares a current value of said detected output current with said preset current value,
20 and stops an operation of said drive control section (6) when the current value of said detected output current becomes less than the preset current value; and

a time measuring section (16) which measures a time after said operation stop section (15) stops the operation of said drive control section (6), and causes said charge control section (17) to resume charging said capacitor (C3) when a preset time elapses since
25 measuring.

[4] The power supply according to claim 3, wherein said charge circuit section is constituted by inserting, between said DC voltage input section (2) and one end of said

capacitor (C3):

a constant current supply section (14) which supplies a constant current to said capacitor (C3); and

a switch (13) which is closed at a time of activation when said DC voltage input section starts inputting the DC voltage.

[5] The power supply according to claim 3, wherein said charge circuit section is constituted by inserting, between said DC voltage input section (2) and one end of said capacitor (C3):

a resistor (R21); and

a switch (13) which is closed at a time of activation when said DC voltage input section (2) starts inputting the DC voltage.

[6] The power supply according to claim 4, wherein said charge control section comprises a switch control section (17) which stops charging of said capacitor (C3) from said charge circuit section (13, 14, R21), and

said time measuring section (16) measures a time after said operation stop section (15) stops the operation of said drive control section (6), and outputs a switch-ON signal to close said switch (13) to said switch control section (17) when a preset time elapses since measuring, thereby resuming charging of said capacitor (C3).

[7] The power supply according to claim 3, wherein a resistor (R22) is connected to both ends of said capacitor (C3), and

said time measuring section (16) considers that the preset time has elapsed when a voltage across said capacitor (C3) becomes equal to or lower than a predetermined value after said operation stop section (15) has stopped the operation of said drive control section (6), and causes said switch control section (17) to resume charging of said capacitor (C3).

[8] The power supply according to claim 2, wherein said transformer (T) has a third winding (n3), and

said drive-control voltage supply section

comprises:

a capacitor (C3) which applies a charged voltage to said drive control section (6) as the drive control voltage;

5 a charge circuit section (R21) which supplies a current to said capacitor from said DC voltage input section of said voltage generating section (2, 3, 4) to charge said capacitor;

an auxiliary power supply section (7) which rectifies a voltage generated on said third winding (n3) of said transformer (T) and applies that voltage to said capacitor (C3) to charge said capacitor (C3);

10 an operation stop section (15) which detects an output current to be supplied to said load, compares a current value of said detected output current with said preset current value, and stops an operation of said drive control section (6) when the current value of said detected output current becomes less than the preset current value;

a discharge control section (13, 17) which discharges a voltage of said capacitor (C3) when a discharge instruction signal is supplied; and

15 a time measuring section (16) which supplies said discharge instruction signal to said discharge control section (13, 17) when said operation stop section (15) stops an operation of said drive control section (6), and stops supplying the discharge instruction signal to said discharge control section (13, 17) when a preset time elapses after time measuring.

[9] The power supply according to claim 8, wherein said charge circuit section comprises
20 a current supply section (14) which supplies a current to said capacitor (C3), and

said discharge control section comprises:

a switch (13) which is open at a time of activation when said DC voltage input section (2) starts inputting the DC voltage; and

25 a switch control section (17) which closes said switch (13) to discharge the voltage of said capacitor (C3), when said operation stop section (15) stops the operation of said drive control section (6).

[10] The power supply according to claim 8, wherein said charge circuit section comprises

a resistor inserted between said DC voltage input section (2) and said capacitor (C3), and
said discharge control section comprises:

a switch (13) which is open at a time of activation when said DC voltage input section
(2) starts inputting the DC voltage; and

5 a switch control section (17) which closes said switch (13) to discharge the voltage of
said capacitor (C3), when said operation stop section (15) stops the operation of said drive
control section (6).

[11] A controlling method for a power supply including a voltage generating section (2, 3,
4) which generates a voltage to be supplied to a load in accordance with a drive signal, and a
10 drive control section (6) which generates said drive signal from a drive control voltage and
supplies said generated drive signal to said voltage generating section (2, 3, 4) to drive said
voltage generating section (2, 3, 4) to supply a voltage to the load, wherein

when said power supply is activated, said drive control voltage is applied to said drive
control section (6) to supply the voltage to said load from said voltage generating section, a
15 current flowing in the load is monitored, application of said drive control voltage to said drive
control section (6) is stopped to stop an operation of said drive control section (6) when said
current becomes less than a preset current value, and after a predetermined time elapses since
stopping, supply of said drive control voltage to said drive control section (6) is started again
to operate said drive control section.